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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

361007-000012

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Signature _____

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name _____

Application Number

09/828,564

Filed

April 6, 2001

First Named Inventor

Joshi, Yogendra

Art Unit

3743

Examiner

Patel, Nihir B.

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

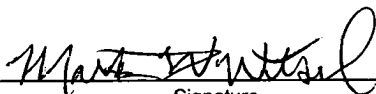
The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)☒ attorney or agent of record. 47,183
Registration number _____☐ attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 _____


Signature

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Typed or printed name

(919) 286-8000

Telephone number

January 6, 2006

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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REMARKS IN SUPPORT OF PRE-APPEAL BRIEF REQUEST FOR REVIEW

Applicants submit that the current and preceding office actions issued by the Examiner in the present application contain clear errors in the Examiner's rejections as well as omissions of one or more essential elements needed for a *prima facie* obviousness rejection.

The pending claims include four independent claims with corresponding dependent claims. Independent claims 1 and 43 are respectively directed to a thermosyphon and to a method of cooling a heat-dissipating electronic element that each include a "boiling enhancement structure." Independent claims 39 and 41 are respectively directed to a thermosyphon and to a cooling-enhanced electronic component, including a thermosyphon, that are each recited to have thermosyphon performance substantially independent of thermosyphon orientation. Although the Applicants disagree with the Examiner's rejections throughout the current and preceding office actions, for the purposes of this request the Applicants will focus on the rejections related to the boiling enhancement structure and the orientation-independent performance requirement.

Claims 1 and 43

Claims 1 and 43 both call for a structure of a thermosyphon that includes a boiling enhancement structure disposed in an evaporator. In the Examiner's *Response to Arguments* in the Office Action dated September 7, 2005, he stated that "the amended/original claims [1 and 43] do not claim the boiling enhancement structure being a porous component that provides re-entrant cavities" (page 2). A boiling enhancement structure, however, is unambiguously and explicitly defined in the Applicants' specification: "The boiling enhancement structure 34 is a porous component that provides re-entrant cavities" (page 10, lines 20-21). "Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim." MPEP 2111.01.III. It was clear error by the Examiner not to recognize that the term "boiling enhancement structure," as used in the claim, is defined in the specification.

Further, no boiling enhancement structure is disclosed or taught in the Examiner's cited references. Accordingly, there are one or more essential elements omitted that are

needed for a *prima facie* obviousness rejection. The Examiner, in clear error, relies on the Ghoshal reference as disclosing a boiling enhancement structure (see Office Action dated September 7, 2005, page 2, paragraph 2, and page 3, paragraph 3). Ghoshal's invention does not involve boiling. This basis for rejection of claims 1 and 43 was previously addressed by the Applicants in detail (reply dated June 21, 2005, page 14, last three lines, through page 16, first six lines); please see that paper for the complete argument, which is abbreviated below in accordance with the encouragement of the pilot program Official Gazette Notice in order to refer to arguments already in the record.

In Ghoshal, the conical "hot point elements 250" are structurally and functionally different than Applicants' boiling enhancement structure. Ghoshal's invention is a heat pipe and is capillary-driven (col. 1, lines 57-59; col. 2, lines 37-48; col. 2, line 62 through col. 3, line 2; col. 3, lines 34-37; col. 4, lines 37-45; see also the claims). The evaporation process of Ghoshal's invention is a thin film surface phenomenon and does not involve the formation of vapor bubbles in the bulk of the liquid (which are a result of boiling) that form in Applicants' invention, as occurs with Applicants' boiling enhancement structure.

Ghoshal is also discussed in the Declaration of Dr. Enchao Yu, filed under 37 CFR § 1.132 (Appendix B to Amendment dated June 9, 2004; see, for example, ¶¶ 13 and 18). This Declaration by a noninventor states that Ghoshal (1) does not teach or suggest a porous component that provides re-entrant cavities, *i.e.* a boiling enhancement structure, and (2) does not function with vapor bubbles, unlike the Applicants' invention (see ¶ 18). There is no indication in the record that indicates that the Examiner considered this evidence, which supports the above arguments for patentability. Lack of consideration of this evidence is clear error.

As Ghoshal does not disclose a boiling enhancement structure, the combined cited references of Andres et al. ("Andres" herein) and Ghoshal do not include every element of Applicants' invention, and there is no *prima facie* case of obviousness. Accordingly, claims 1 and 43 are nonobvious with respect to Andres in view of Ghoshal.

Claims 39 and 41

Claims 39 and 41 call for a thermosyphon with performance substantially independent of thermosyphon orientation. The Examiner, in clear error, relies on Andres

to disclose this limitation. Andres' invention's performance is not independent of orientation and it is not a thermosyphon.

The Andres invention does not have performance independent of orientation. The Examiner noted that "Andres states that 'the heat exchanger is independent of gravitational and inertia forces. It is assured thereby that condensate will always collect within the area of the heat supply by the heating rod, the heating channel or the like and is evaporated by the heat source.'" (Office Action dated September 7, 2005, page 2). The Examiner considered this to mean that the Andres device is orientation-independent. The Applicants respectfully disagree. While Andres makes this statement, it is not true that the Andres device performance is orientation independent. The Applicants' arguments related to independence of orientation were previously presented in detail (see reply dated June 21, 2005, page 13, second paragraph, through page 14, third line). For example, it may immediately be seen by inspection that given the dish-shaped geometry of the device, with the device upside down, coolant would not be present in the evaporator, or very little of it would be present (Andres Figures 7 and 8, area 8). Clearly the device would not function as well and might not function at all without coolant in the evaporator.

Andres is directed to a right-side-up installation that is alleged to be helpful for motor vehicles, aircraft, or ships that must deal with inclinations, acceleration, and deceleration (Andres col. 1, lines 22-28). The Applicants' invention, however, operates over a much greater range of orientation – namely, performance is substantially independent of *any* orientation. For example, the inverted Applicants' invention (for example, Applicant's Figure 8) operates substantially the same as it does when right-side-up (Figure 3), with the evaporator substantially full or full, but as stated above, if inverted Andres' evaporator (Andres's Figures 7 and 8, area 8) would be empty or near empty, with performance therefore significantly impaired. Performance results would likewise be similar in the case where the devices are vertically oriented, with the Applicants' invention (for example, Applicant's Figures 6 and 7) performing similarly to when it is horizontal and Andres' invention's performance impaired. Accordingly, Andres' invention's performance is not disclosed or taught to be substantially independent of orientation, and claims 39 and 41 are nonobvious. (Prior arguments were made at reply

dated June 21, 2005, page 13 second paragraph through first 3 lines of page 14). It is clear error for the Examiner to assert that the invention of Andres performs independently of orientation.

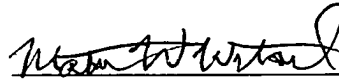
Andres' invention is a capillary-driven device, in that it is a heat pipe (see, *e.g.*, col. 1, lines 29-44; col. 2, lines 50-56; col. 3, lines 63-68; see also the claims). The Applicants' arguments were previously made in detail (see reply dated June 21, 2005, paragraph starting at the bottom of page 15). A boiling based thermosyphon creates a combination of buoyancy force and bubble pumping action to drive the circulation of the coolant. A heat pipe based device such as that disclosed by Andres must avoid formation of bubbles from boiling of the coolant. If the Andres device indeed utilized boiling, there would be a distinct possibility of dryout or vapor locking in the network of channels, rendering the device unusable under high heat load conditions, and under certain orientations, which are not addressed in Andres. Andres does not disclose a thermosyphon, and it is clear error for the Examiner to assert otherwise.

There is no likelihood of success in combining Andres and Ghoshal to achieve the Applicants' invention, as both Andres and Ghoshal are capillary-driven (neither are thermosyphons) and neither are devices that function based on vapor bubble formation. Likewise, Andres and Ghoshal include no motivation or suggestion to combine their teachings. (Prior arguments made at reply dated June 21, 2005, page 14, last three lines, through page 16, first 6 lines). Therefore, there is no basis for a *prima facie* obvious rejection.

As the Examiner's rejections of claims 1, 39, 41, and 43 have been shown to be in clear error and lack essential elements of a *prima facie* obviousness rejection, it is requested that these claims, and all the pending claims depending directly or indirectly therefrom, be allowed to issue.

Respectfully submitted,

Date: January 6, 2006



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